

**Report of the Committee on****Fire and Emergency Services Protective Clothing and Equipment****Richard M. Duffy, Chair**

International Association of Fire Fighters, DC [L]

**William M. Lambert, Secretary**

Mine Safety Appliances Company, PA [M] Rep. Compressed Gas Association

**Leslie Anderson**, USDA Forest Service, MT [E]  
**Roger L. Barker**, North Carolina State University, NC [SE]  
**Nicholas J. Curtis**, Lion Apparel, Inc., OH [M]  
**Robert A. Freese**, Globe Manufacturing Company, NH [M]  
**Andy Gbur**, Intertek, OH [RT]  
**Bill Grilliot**, Morning Pride Manufacturing, LLC, OH [M]  
 Rep. Fire and Emergency Manufacturers and Services Association Inc.  
**Kimberly M. Henry**, Celanese Advanced Materials Inc., NC [M]  
**James S. Johnson**, Lawrence Livermore National Laboratory, CA [RT]  
**Cy Long**, Texas Commission on Fire Protection, TX [E]  
**David G. Matthews**, Fire & Industrial (P.P.E) Ltd., England [SE]  
**Richard W. Metzler**, US Department of Health & Human Services, PA [RT]  
**Jim Minx**, Oklahoma State Firefighters Association, OK [C]  
 Rep. Oklahoma State Firefighters Association  
**Stephen R. Sanders**, Safety Equipment Institute (SEI), VA [RT]  
**Denise N. Statham**, Southern Mills, Inc., GA [M]  
**Jeffrey O. Stull**, International Personnel Protection, Inc., TX [SE]  
**David Trivette**, Tyco/Scott Health & Safety, NC [M]  
 Rep. International Safety Equipment Association  
**Robert D. Tutterow, Jr.**, Charlotte Fire Department, NC [U]  
 Rep. Fire Industry Equipment Research Organization  
**Harry P. Winer**, US Department of the Navy, MA [RT]

**Alternates**

**Jason L. Allen**, Intertek, NY [RT]  
 (Alt. to Andy Gbur)  
**Eric J. Beck**, Mine Safety Appliances Company, PA [M]  
 (Alt. to William M. Lambert)  
**Leslie F. Boord**, US Department of Health & Human Services, PA [RT]  
 (Alt. to Richard W. Metzler)  
**Janice C. Bradley**, International Safety Equipment Association, VA [M]  
 (Alt. to David Trivette)  
**Steven D. Corrado**, Underwriters Laboratories Inc., NC [RT]  
 (Voting Alt. to UL Rep.)  
**Patricia A. Freeman**, Globe Manufacturing Company, NH [M]  
 (Alt. to Robert A. Freese)  
**Patricia A. Gleason**, Safety Equipment Institute (SEI), VA [RT]  
 (Alt. to Stephen R. Sanders)  
**Mary I. Grilliot**, TFG/Morning Pride Manufacturing LLC, OH [M]  
 (Alt. to Bill Grilliot)  
**Steven B. Lumry**, Oklahoma City Fire Department, OK [C]  
 (Alt. to Jim Minx)  
**Andrew P. Perrella**, E.I. DuPont Company, DE [M]  
 (Alt. to Kimberly M. Henry)  
**Frank P. Taylor**, Lion Apparel, Inc., VA [M]  
 (Alt. to Nicholas J. Curtis)

**Nonvoting**

**Donna P. Brehm**, Virginia Beach Fire Department, VA [U]  
 Rep. TC on Emergency Medical Services PC&E  
**Don R. Forrest**, United Firefighters of Los Angeles City, CA [L]  
 Rep. TC on Special Operations PC&E  
**George M. Jackson**, USDA Forest Service, MT [E]  
 Rep. TC on Wildland Fire Fighting PC&E  
**Glenn P. Jirka**, Miami Township Fire & EMS Division, OH [E]  
 Rep. TC on Hazardous Materials PC&E  
**Kirk Owen**, Plano Fire Department, TX [U]  
 Rep. TC on Structural and Proximity Fire Fighting PC&E  
**Ray F. Reed**, Dallas Fire Department, TX [U]  
 Rep. TC on Respiratory Protection Equipment  
**Bruce H. Varner**, Santa Rosa Fire Department, CA [E]  
 Rep. TC on Electronic Safety Equipment

**Committee Scope:** This Committee shall have primary responsibility for documents on the design, performance, testing, and certification of protective clothing and protective equipment manufactured for fire and emergency services organizations and personnel, to protect against exposures encountered during emergency incident operations. This Committee shall also have the primary responsibility for documents on the selection, care, and maintenance of such protective clothing and protective equipment by fire and emergency services organizations and personnel.

**Report of the Committee on****Hazardous Materials Protective Clothing and Equipment****Glenn P. Jirka, Chair**Miami Township Fire & EMS Division, OH [E]  
Rep. The InterAgency Board**Patricia A. Gleason, Secretary**

Safety Equipment Institute (SEI), VA [RT]

**William Alexander**, Onguard Industries, MD [M]  
**Jeffrey B. Borkowski**, Fire Department, City of New York, NY [U]  
**Steven D. Corrado**, Underwriters Laboratories Inc., NC [RT]  
**Steven M. De Lisi**, Virginia Air National Guard, VA [U]  
**Wade G. DeHate**, Hillsborough County Fire Rescue, FL [E]  
**Jan Dunbar**, El Dorado Hills, CA [E]  
 Rep. International Association of Fire Chiefs  
**Daniel Gohlke**, W. L. Gore & Associates, MD [M]  
**Kevin W. Klamser**, US Navy Coastal Systems Station, FL [RT]  
**Karen E. Lehtonen**, Lion Apparel, Inc., OH [M]  
**Trudy J. Lewis**, Battelle Memorial Institute, OH [RT]  
**Ulf Nystrom**, Trelleborg Protective Products AB, Sweden [M]  
**Louis V. Ott**, Gentex Corporation, PA [M]  
 Rep. International Safety Equipment Association  
**Kenneth A. Pever**, Guardian Manufacturing Company, OH [M]  
**Mel Seng**, TFG/Norcross Safety Products, IL [M]  
**Jeffrey O. Stull**, International Personnel Protection, Inc., TX [SE]  
**Jonathan V. Szalajda**, US Department of Health & Human Services, PA [E]  
**Robert West**, Texas Instruments, TX [U]  
**James P. Zeigler**, DuPont Personal Protection, VA [M]  
**Michael Ziskin**, Field Safety Corporation, CT [RT]

**Alternates**

**Dale Gregory Beggs**, Texas Instruments, TX [U]  
 (Alt. to Robert West)  
**Nicholas J. Curtis**, Lion Apparel, Inc., OH [M]  
 (Alt. to Karen E. Lehtonen)  
**Russell R. Greene**, Battelle Memorial Institute, OH [RT]  
 (Alt. to Trudy J. Lewis)  
**Andy Gbur**, Intertek, OH [RT]  
 (Voting Alt. to Intertek Rep.)  
**A. Ira Harkness**, US Department of the Navy, FL [RT]  
 (Alt. to Kevin W. Klamser)  
**Thomas M. Pease**, Gentex Corporation, PA [M]  
 (Alt. to Louis V. Ott)  
**John Reilly**, Total Fire Group, OH [M]  
 (Alt. to Mel Seng)  
**Angie M. Shepherd**, Underwriters Laboratories Inc., NC [RT]  
 (Alt. to Steven D. Corrado)

**Committee Scope:** This Committee shall have primary responsibility for documents on protective clothing and protective equipment, except respiratory protective equipment, that provides hand, foot, torso, limb, and head protection for fire fighters and other emergency services responders during incidents that involve hazardous materials operations. These operations involve the activities of rescue; hazardous material confinement, containment, and mitigation; and property conservation where exposure to substances that present an unusual danger to responders are present or could occur due to toxicity, chemical reactivity, decomposition, corrosiveness, or similar reactions.

Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of hazardous materials protective clothing and protective equipment by fire and emergency services organizations and personnel.

**Report of the Committee on  
Special Operations Protective Clothing and Equipment**

**Don R. Forrest, Chair**  
United Firefighters of Los Angeles City, CA [L]

**Jeffrey O. Stull, Secretary**  
International Personnel Protection, Inc., TX [SE]

**Steven D. Corrado**, Underwriters Laboratories Inc., NC [RT]  
**Dean W. Cox**, Fairfax County Fire & Rescue Department, VA [U]  
**Nicholas J. Curtis**, Lion Apparel, Inc., OH [M]  
**James A. Frank**, CMC Rescue, Inc., CA [M]  
**Hamid M. Ghorashi**, E. I. DuPont de Nemours and Co., Inc., VA [M]  
**Daniel Gohlke**, W. L. Gore & Associates, MD [M]  
**Donald F. Hayde**, Fire Department City of New York, NY [U]  
**Diane B. Hess**, Celanese Advanced Materials Inc., NC [M]  
**Steve Hudson**, Pigeon Mountain Industries, Inc., GA [M]  
**H. Dean Paderick**, Special Rescue International, VA [SE]  
**Jack Reall**, Columbus Fire Division, OH [U]  
**Stephen R. Sanders**, Safety Equipment Institute (SEI), VA [RT]  
**Kelly Sisson**, City of La Mesa Fire Department, CA [U]  
**Michael T. Stanhope**, Southern Mills, Inc., GA [M]  
**Harry P. Winer**, US Department of the Navy, MA [RT]

**Alternates**

**Andy Gbur**, Intertek, OH [RT]  
 (Voting Alt. to Intertek Rep.)  
**Kimberly M. Henry**, Celanese Advanced Materials Inc., NC [M]  
 (Alt. to Diane B. Hess)  
**Kim Klaren**, Fairfax County Fire & Rescue Department, VA [U]  
 (Alt. to Dean W. Cox)  
**Karen E. Lehtonen**, Lion Apparel, Inc., OH [M]  
 (Alt. to Nicholas J. Curtis)  
**Loui (Clem) McCurley**, Pigeon Mountain Industries, Inc., CO [M]  
 (Alt. to Steve Hudson)  
**Stephen G. Rasweiler**, Fire Department City of New York, NY [U]  
 (Alt. to Donald F. Hayde)  
**Brennan E. Sigmon**, Underwriters Laboratories, Inc., NC [RT]  
 (Alt. to Steven D. Corrado)  
**Denise N. Statham**, Southern Mills, Inc., GA [M]  
 (Alt. to Michael T. Stanhope)

**Committee Scope:** This Committee shall have primary responsibility for documents on special operations protective clothing and protective equipment, except respiratory equipment, that provides hand, foot, torso, limb, head, and interface protection for fire fighters and other emergency services responders during incidents involving special operations functions including, but not limited to, structural collapse, trench rescue, confined space entry, urban search and rescue, high angle/mountain rescue, vehicular extraction, swift water or flooding rescue, contaminated water diving, and air operations.

This Committee shall also have primary responsibility for documents on station/work uniform garments that are not of themselves primary protective garments but can be combined with a primary protective garment to serve dual or multiple functions.

Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of special operations protective clothing and equipment by fire and emergency services organizations and personnel.

**Report of the Committee on  
Structural and Proximity Fire Fighting Protective Clothing and Equipment**

**Kirk Owen, Chair**  
Plano Fire Department, TX [U]  
Rep. NFPA Fire Service Section

**Patricia A. Freeman, Secretary**  
Globe Manufacturing Company, NH [M]

**Donald Aldridge**, Lion Apparel, Inc., OH [M]  
**Jason L. Allen**, Intertek, NY [RT]  
**James M. Baker**, National Safety Clean, Inc., PA [IM]  
**Claude Barbeau**, Bacou-Dalloz Protective Apparel Ltd., Canada [M]  
**Roger L. Barker**, North Carolina State University, NC [SE]  
**Karl J. Beeman**, Ensemble Care & Maintenance Services, NV [IM]  
**Shane Bray**, Mine Safety Appliances Company, PA [M]  
**Donna P. Brehm**, Virginia Beach Fire Department, VA [U]

**Bill Burke**, Fire-Dex, Incorporated, OH [M]  
**Michael Carlin**, La Mesa Fire Department, CA [U]  
**Steven D. Corrado**, Underwriters Laboratories Inc., NC [RT]  
**Dean W. Cox**, Fairfax County Fire & Rescue Department, VA [U]  
**Don R. Forrest**, United Firefighters of Los Angeles City, CA [L]  
**Greg Gammon**, Las Vegas Fire and Rescue, NV [E]  
 Rep. International Association of Fire Chiefs  
**Mary I. Grilliot**, TFG/Morning Pride Manufacturing LLC, OH [M]  
**Stephen J. King**, Deer Park, NY [SE]  
**James R. Lawson**, US National Institute of Standards & Technology, MD [RT]  
**Cy Long**, Texas Commission on Fire Protection, TX [E]  
**Michael F. McKenna**, Sacramento Metropolitan Fire District, CA [U]  
**Richard A. Oleson**, E. D. Bullard Company, KY [M]  
**Louis V. Ott**, Gentex Corporation, PA [M]  
**Tom Ragan**, Shelby Specialty Gloves, TN [M]  
**R. Wendell Robison**, Fillmore, UT [C]  
 Rep. National Volunteer Fire Council  
**Kevin M. Roche**, Phoenix Fire Department, AZ [U]  
 Rep. International Fire Service Training Association  
**James S. Spahr**, US Department of Health & Human Services, WV [RT]  
**Jeffrey O. Stull**, International Personnel Protection, Inc., TX [SE]  
**William Swope**, Lexington Fayette Urban County Government, KY [U]  
**Jim Tate**, Fort Worth Fire Fighters Association, TX [L]  
 Rep. International Association of Fire Fighters  
**Robert D. Tutterow, Jr.**, Charlotte Fire Department, NC [U]  
 Rep. Fire Industry Equipment Research Organization  
**Harry P. Winer**, US Department of the Navy, MA [RT]

**Alternates**

**Anthony Di Giovanni**, Bacou-Dalloz Protective Apparel Ltd., Canada [M]  
 (Alt. to Claude Barbeau)  
**Tim Durby**, City of Phoenix, AZ [U]  
 (Alt. to Kevin M. Roche)  
**Steven Garcia**, Fire-Dex, Incorporated, OH [M]  
 (Alt. to Bill Burke)  
**Andy Gbur**, Intertek, OH [RT]  
 (Alt. to Jason L. Allen)  
**Bill Grilliot**, Morning Pride Manufacturing, LLC, OH [M]  
 (Alt. to Mary I. Grilliot)  
**Allen S. Hay**, New York City Fire Department, NY [U]  
 (Voting Alt. to FDNY Rep.)  
**F. Joseph Hersick**, Mine Safety Appliances Company, PA [M]  
 (Alt. to Shane Bray)  
**Kim Klaren**, Fairfax County Fire & Rescue Department, VA [U]  
 (Alt. to Dean W. Cox)  
**Karen E. Lehtonen**, Lion Apparel, Inc., OH [M]  
 (Alt. to Donald Aldridge)  
**Robin B. Moore**, Underwriters Laboratories Inc., NC [RT]  
 (Alt. to Steven D. Corrado)  
**Ted E. Nonini**, United Fire Fighters of Los Angeles City, CA [L]  
 (Alt. to Don R. Forrest)  
**Kelly Sisson**, City of La Mesa Fire Department, CA [U]  
 (Alt. to Michael Carlin)  
**Charles C. Soros**, Fire Department Safety Officers Association, WA [SE]  
 (Alt. to Jeffrey O. Stull)  
**Donald B. Thompson**, North Carolina State University, NC [SE]  
 (Alt. to Roger L. Barker)  
**Robert Vettori**, US National Institute of Standards & Technology, MD [RT]  
 (Alt. to James R. Lawson)  
**Donald D. Welch, II**, Globe Manufacturing Company, NH [M]  
 (Alt. to Patricia A. Freeman)

**Nonvoting**

**Matthew I. Chibbaro**, US Department of Labor, DC [E]  
 Rep. Occupational Safety & Health Administration  
 (Alt. to NV Principal)  
**Robert B. Bell**, US Department of Labor, DC [E]  
 Rep. Occupational Safety & Health Administration

**Committee Scope:** This Committee shall have primary responsibility for documents on protective ensembles, except respiratory protection, that provides head, limb, hand, foot, torso, and interface protection for fire fighters and other emergency services responders during incidents involving structural fire fighting operations or proximity fire fighting operations.

Structural fire fighting operations include the activities of rescue, fire suppression, and property conservation during incidents involving fires in buildings, enclosed structures, vehicles, marine vessels, or like properties. Proximity fire fighting operations include the activities of rescue, fire suppression, and property conservation during incidents involving commercial and military aircraft fires, bulk flammable gas fires, bulk flammable and combustible liquids fires, combustible metal fires, exotic fuel fires, and other such fires that produce very high levels of radiant heat as well as convective and conductive heat.

Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of structural and proximity fire fighting protective ensembles by fire and emergency services organizations and personnel.

*These lists represent the membership at the time each Committee was balloted on the text of this report. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of the document.*

Staff Liaison: **Bruce Teele**

The Committee on **Fire and Emergency Services Protective Clothing and Equipment** is presenting four Reports for adoption, as follows:

The Reports were prepared by the:

- Technical Correlating Committee on **Fire and Emergency Services Protective Clothing and Equipment** (FAE-AAC)
- Technical Committee on Hazardous Materials Protective Clothing and Equipment (FAE-HAZ)
- Technical Committee on Special Operations Protective Clothing and Equipment (FAE-SCE)
- Technical Committee on Structural and Proximity Fire Fighting Protective Clothing and Equipment (FAE-SPF)

**Report I:** The Technical Committee proposes for adoption, a complete revision to NFPA 1971, **Standard on Protective Ensemble for Structural Fire Fighting**, 2000 edition. NFPA 1971-2000 is published in Volume 11 of the 2004/2005 National Fire Codes and in separate pamphlet form.

NFPA 1971 has been submitted to letter ballot of the **Technical Committee on Structural and Proximity Fire Fighting Protective Clothing and Equipment** which consists of 33 voting members; of whom 30 voted affirmatively, 1 negatively after circulation of any negative votes (Bray), and 2 ballots were not returned (Robison, Swope).

Mr. Bray voted negatively stating:

- Protective Hood Interface Component CBR Design Requirements for Both Ensembles, section 6.20.16.2 should include a requirement for a chemical/biological/particulate barrier layer to be included in the protective hood. The hood is in contact with the firefighter's neck, face and head and best suited to provide dermal protection. It also interfaces with a SCBA facepiece that the firefighter would wear in response to a WMD incident. An added benefit to making the hood a required design element of a CBR protective garment is that it provides the firefighter with a continuous level of CBR protection.

- In 8.A.2.1 samples for inward leakage testing, the helmet should not be required to undergo testing when the helmet does not form part of the CBR protective ensemble. The CBR protective ensemble should be tested and approved less the helmet.

Mr. Barbeau voted affirmatively with this comment:

I am concerned about that the labeling information can be misinterpreted, Eg: 5.2.1 "THIS XXXX MEETS THE STRUCTURAL FIRE FIGHTING XXXX REQUIREMENTS OF NFPA 1971 ON PROTECTIVE ENSEMBLES FOR STRUCTURAL FIRE FIGHTING AND PROXIMITY FIRE FIGHTING 2006 EDITION. DO NOT REMOVE THIS LABEL." It is possible that anyone reading this on the inside of a structural coat may be led to believe that they are also adequately protected to fight a high-radiant heat fire. I understand that we are referring to the title of the standard, but it may not be so obvious when read on a label for the first time.

Section 6.20: "Chemical" and "Biological" are accurate terms, but I am unsure about leaving the word "Radiological" are we testing for this? Should we be more precise with "Particulate Barrier".

We are concerned about this test, prior to the ROP no test results were shared at the meeting and no indicator of pass or fail was described. Additionally the TPP machine would have to be modified to include compression capability to Jan 2006. Additionally, this process should involve a round-robin test of fabric combinations. We are concerned about meeting the timeline.

Ms. Grillot voted affirmatively with this comment:

I am voting yes with a comment to be circulated to the committee in hopes that corrections can be made before the ROC vote:

1. The Committee Action taken on Proposals – Log 127 page 24 of 1971 and its counter part Log 10 of 1976 needs to be re-addressed. For a component to be subjected to a simple oven test and pass if it totally vaporizes but does not melt, separate, or ignite cannot be the desire of the committee. Garments labeled to the 2000 edition of the 1971 standard contained unidentified moisture barrier materials in the front area of the garment (which in my opinion were definitely needed to pass the shower test) and had the barrier portion of the material totally

disappear sometime during the oven test leaving only what the bare woven subright material remaining – this material did pass the Standard as currently written and were used in NFPA 1971/2000 certified garment construction.

2. The Committee Statement rational on Log 7 of 1976 rejecting the allowance of the OPTION of the Authority Having Jurisdiction (AHJ) conducting a risk assessment and modifying a proximity garment to allow for the stress relief found in the breathability of a 1971 composite in the rear area of the garment (not facing the radiant challenge) is contrary to fire services desire to provide a less stressful ensemble. This is an important option for many applications but certainly would not be appropriate for all applications – the AHJ should be given the opportunity of evaluating such an option if their risk assessment finds the option acceptable.

Mr. Spahr voted affirmatively with this comment:

1. Tables 6.7.6(a) through Table 6.7.6(c) all have the same typographical error – there should be a hyphen between the range numbers for all dimensions. See last two columns; example "16.2517.25" should read "16.25 – 17.25."

2. Table 6.7.6(b) Small Glove Sizing (page 44)  
Digit 4 length has a math error. (compare with NFPA 1977 and 1976 for fourth digit length where the tolerance are all 600 mm or .25 in. or .635 cm). The correct range should be "6.55 – 7.82" (not 6.55 – 7.03).

3. Table 6.7.6(c) Medium Glove Sizes is missing entire column for "inches" (range to be accommodated). (page 44)

Mr. Stull voted affirmatively with this comment:

I believe the committee has done a great job in assembling the ROP document that included consolidation of two standards, a formatting change, and several comprehensive issues. While I am voting in favor of the document, I would like to express my opinions on several different actions since I was unable to attend the last two committee meetings due to health reasons.

**Proposal 1971-8 Log #106, Proposal 1971-9 Log #109, and Proposal 1971-10 Log #108:** While I understand the committee's position to move the decision on definitions to the TCC, I firmly believe that the current definitions for the moisture barrier (Log #106), outer shell (Log #109), and thermal barrier (Log #108) are clearly out of date and are inaccurate. These definitions have remained unchanged since earlier editions and have failed to capture the increased multifunctional performance aspects of these layers as addressed in the addition of new requirements implemented in the past couple of revisions. I further feel that the committee is negligent is specifically addressing facings, which often can be an entirely different material than the moisture barrier and that should be evaluated for the same properties as the moisture barrier.

**Proposal 1971-24 Log #115 and Proposal 1971-25 Log #116:** It is inappropriate for a performance requirement and test method to establish a design requirement. Current test requirements for CCHR establish a requirement for reinforcements on the shoulders and knees. Whereas in the current edition, this may have meant no reinforcement at all for the shoulder areas, the newly proposed requirement for a CCHR requirement of 25 as applied to both areas will necessitate the use of additional layers in the construction of this clothing for reinforcement. The committee must specify some minimum area and position of the reinforcements, which of course can be exceeded by the manufacturer in their respective designs. The proposed requirements are consistent with the sample requirements specified in the test method.

**Proposal 1971-28 Log #104:** While I think this proposal is an outstanding idea, I do not believe that it should mandatory to have a drag rescue device in all clothing. Certainly, similar devices could be created on the SCBA to achieve the same purpose with less effect on the clothing.

**Proposal 1971-31 Log #99:** I find it incredulous as much as the committee deliberated on establishing a minimum weight requirement for footwear that it should then accept a proposal to increase the minimum height of footwear and therefore essentially mandate a higher burden to the fire fighter. The committee judiciously decided to forego a minimum weight requirement in anticipation of a detailed ergonomic study that addressed footwear and other elements. The incorporation of improved design requirements for ensuring that the moisture barrier extends higher in the footwear will partly address concerns for liquids leaking through footwear. Fire fighters should be extended the same choices for footwear height as afforded by the current edition of the standard.

**Proposal 1971-39 Log #103:** I would like to go on record as finding the "Light Degradation Test" as fallacious. While the intent of the test is worthy, the task group and the committee have failed in demonstrating that the mode of moisture barrier failure on which the test is based is truly the cause of the Breathetex degradation problem. No evidence has been ever been provided that UV degradation alone (even along with the laundering and heat conditioning) adequately explains the phenomena observed in the field. The fact that the chosen conditions would render most outer shell materials to a completely unusable state, remembering that it would be the outer shell that is attenuating the vast majority of UV light exposure, is proof positive that the selected test conditions fail to appropriately mimic the conditions of Breathetex failure. I understand that the task group expended a great effort in developing the



proposed requirements, but the commitment of these resources in of itself does not constitute a valid reason for adding this requirement. Consider that if Breathetex degradation had been instead the result of a product defect, either in the film or manufacturing process or both, that was limited to only a portion of the material placed in the marketplace, then the proposed test would have no value whatsoever. I believe the committee should reconsider the test on the basis of its merits only as compared the original direction of the task group to prevent "Breathetex-like failures."

**Proposal 1971-41 Log #87:** An additional part of the substantiation should include the IAFF Indianapolis Study, "Field Evaluation of Protective Clothing Effects on Fire Fighter Physiology: Predictive Capability of Total Heat Loss Test," which provided the basis of the selected requirement of 170 W/m<sup>2</sup>.

**Proposal 1971-45 Log #23:** It is my hope that when the committee set the criteria for strength for hook and pile closures that they minimum limits were established above current aramid hook and pile closures as these closures are considered to have less than adequate strength/durability. This practice would then provide a target for improvement of such closures to overcome their current limitations.

**Proposal 1971-75 Log #107:** How can the committee use the substantiation of an "industrial" based method as the basis for a fire fighter helmet? Both footwear and gloves are subjected to the proposed higher heat flux flame because they are tested as "whole" items as is the helmet. The exemption of helmets from the same practice while permitting a longer afterflame time show a glaring inconsistency in the standard to apply minimum performance criteria for evaluating the ensemble in the same manner.

**Proposal 1971-86 Log #85:** I do not understand the reasons compelling the committee to accept another emergency condition test (we already have the TPP test, which can yield further information if additional results are reported). The charter of the Thermal Task Group was to investigate test methods that evaluate burn injuries that occur in situations under "ordinary" fire ground conditions where destruction of the outer shell is not observed. The proposed test does not fulfill this direction. Further, it has not received an adequate review and is dubious for providing additional results for characterizing composite performance.

**Proposal 1971-118 Log #27:** The submitter is misinformed on the basis of the shower test. A longer shower test is predicated on the fact that additional time is necessary for inward leakage to manifest itself on the inner liquid absorptive garment. Given that the three layer construction of structural fire fighting protective clothing, the longer duration is necessary to provide an adequate assessment of liquid integrity. EMS clothing on the other hand is one or two layers, lacking a relatively thick insulative thermal barrier. Furthermore, the decision to move to a 8 minute shower test for NFPA 1999 was controversial, resulting in a split vote at the committee ROC meeting requiring the tiebreaker to be cast by the chairperson.

**Proposal 1971-124 Log #118:** The conditioning requirement does not make sense. No where in the conditioning procedure is the amount of moisture specified. Rather, the amount of water that is absorbed by the respective thermal barrier material is dependent on the material itself and the conditions of the blotting paper and laboratory wringer. No substantiation has been provided for the basis of the 30% weight by mass requirement for Aralite as a justifiable moisture condition. I note that this requirement was apparently written within the meeting without full committee review (at the meeting).

NFPA 1971 has also been submitted to letter ballot of the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment**, which consists of 21 voting members; of whom 21 voted affirmatively.

Mr. Stull voted affirmatively with this comment:

I believe the committee has done a great job in assembling the ROP document that included consolidation of two standards, a formatting change, and several comprehensive issues. While I am voting in favor of the document, I would like to express my opinions on several different actions since I was unable to attend the last two committee meetings due to health reasons.

**Proposal 1971-8 Log #106, Proposal 1971-9 Log #109, and Proposal 1971-10 Log #108:** While I understand the committee's position to move the decision on definitions to the TCC, I firmly believe that the current definitions for the moisture barrier (Log #106), outer shell (Log #109), and thermal barrier (Log #108) are clearly out of date and are inaccurate. These definitions have remained unchanged since earlier editions and have failed to capture the increased multifunctional performance aspects of these layers as addressed in the addition of new requirements implemented in the past couple of revisions. I further feel that the committee is negligent is specifically addressing facings, which often can be an entirely different material than the moisture barrier and that should be evaluated for the same properties as the moisture barrier.

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some minimum area and position of the reinforcements, which of course can be exceeded by the manufacturer in their respective designs. The proposed requirements are consistent with the sample requirements specified in the test method.

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**Proposal 1971-31 Log #99:** I find it incredulous as much as the committee deliberated on establishing a minimum weight requirement for footwear that it should then accept a proposal to increase the minimum height of footwear and therefore essentially mandate a higher burden to the fire fighter. The committee judiciously decided to forego a minimum weight requirement in anticipation of a detailed ergonomic study that addressed footwear and other elements. The incorporation of improved design requirements for ensuring that the moisture barrier extends higher in the footwear will partly address concerns for liquids leaking through footwear. Fire fighters should be extended the same choices for footwear height as afforded by the current edition of the standard.

**Proposal 1971-39 Log #103:** I would like to go on record as finding the "Light Degradation Test" as fallacious. While the intent of the test is worthy, the task group and the committee have failed in demonstrating that the mode of moisture barrier failure on which the test is based is truly the cause of the Breathetex degradation problem. No evidence has been ever been provided that UV degradation alone (even along with the laundering and heat conditioning) adequately explains the phenomena observed in the field. The fact that the chosen conditions would render most outer shell materials to a completely unusable state, remembering that it would be the outer shell that is attenuating the vast majority of UV light exposure, is proof positive that the selected test conditions fail to appropriately mimic the conditions of Breathetex failure.

I understand that the task group expended a great effort in developing the proposed requirements, but the commitment of these resources in of itself does not constitute a valid reason for adding this requirement. Consider that if Breathetex degradation had been instead the result of a product defect, either in the film or manufacturing process or both, that was limited to only a portion of the material placed in the marketplace, then the proposed test would have no value whatsoever. I believe the committee should reconsider the test on the basis of its merits only as compared the original direction of the task group to prevent "Breathetex-like failures."

**Proposal 1971-41 Log #87:** An additional part of the substantiation should include the IAFF Indianapolis Study, "Field Evaluation of Protective Clothing Effects on Fire Fighter Physiology: Predictive Capability of Total Heat Loss Test," which provided the basis of the selected requirement of 170 W/m<sup>2</sup>.

**Proposal 1971-45 Log #23:** It is my hope that when the committee set the criteria for strength for hook and pile closures that they minimum limits were established above current aramid hook and pile closures as these closures are considered to have less than adequate strength/durability. This practice would then provide a target for improvement of such closures to overcome their current limitations.

**Proposal 1971-75 Log #107:** How can the committee use the substantiation of an "industrial" based method as the basis for a fire fighter helmet? Both footwear and gloves are subjected to the proposed higher heat flux flame because they are tested as "whole" items as is the helmet. The exemption of helmets from the same practice while permitting a longer afterflame time show a glaring inconsistency in the standard to apply minimum performance criteria for evaluating the ensemble in the same manner.

**Proposal 1971-86 Log #85:** I do not understand the reasons compelling the committee to accept another emergency condition test (we already have the TPP test, which can yield further information if additional results are reported). The charter of the Thermal Task Group was to investigate test methods that evaluate burn injuries that occur in situations under "ordinary" fire ground conditions where destruction of the outer shell is not observed. The proposed test does not fulfill this direction. Further, it has not received an adequate review and is dubious for providing additional results for characterizing composite performance.

**Proposal 1971-118 Log #27:** The submitter is misinformed on the basis of the shower test. A longer shower test is predicated on the fact that additional time is necessary for inward leakage to manifest itself on the inner liquid absorptive garment. Given that the three layer construction of structural fire fighting protective clothing, the longer duration is necessary to provide an adequate assessment of liquid integrity. EMS clothing on the other hand is one or two layers, lacking a relatively thick insulative thermal barrier. Furthermore, the decision to move to a 8 minute shower test for NFPA 1999 was controversial, resulting in a split vote at the committee ROC meeting requiring the tiebreaker to be cast by the chairperson.

**Proposal 1971-124 Log #118:** The conditioning requirement does not make sense. No where in the conditioning procedure is the amount of moisture specified. Rather, the amount of water that is absorbed by the respective thermal barrier material is dependent on the material itself and the conditions of the blotting paper and laboratory wringer. No substantiation has been provided for the basis of the 30% weight by mass requirement for Aralite as a justifiable moisture condition. I note that this requirement was apparently

written within the meeting without full committee review (at the meeting).

Mr. Trivette voted affirmatively with comment:

The TCC should not be used as a tool for personal agenda. The notes that the TCC put in 1971 should have been in the ROP or left for the ROC.

This document when adopted will be redesignated as NFPA 1971, **Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting**.

**Report II:** The Technical Committee proposes for adoption, a withdrawal to NFPA 1976, **Standard on Protective Ensemble for Proximity Fire Fighting**, 2000 edition. NFPA 1976-2000 is published in Volume 12 of the 2004/2005 National Fire Codes and in separate pamphlet form.

NFPA 1976 has been submitted to letter ballot of the **Technical Committee on Structural and Proximity Fire Fighting Protective Clothing and Equipment**

which consists of 33 voting members; of whom 28 voted affirmatively, and 5 ballots were not returned (Allen, Carlin, Swope, Winer, Hay).

NFPA 1976 has also been submitted to letter ballot of the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment**, which consists of 21 voting members; of whom 21 voted affirmatively.

**Report III:** The Technical Committee proposes for adoption, a complete revision to NFPA 1983, **Standard on Fire Service Life Safety Rope and System Components**, 2001 edition. NFPA 1983-2001 is published in Volume 12 of the 2004/2005 National Fire Codes and in separate pamphlet form.

NFPA 1983 has been submitted to letter ballot of the **Technical Committee on Special Operations Protective Clothing and Equipment**, which consists of 18 voting members; of whom 15 voted affirmatively, and 3 ballots were not returned (Ghorashi, Sisson, Stanhope).

NFPA 1983 has also been submitted to letter ballot of the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment**, which consists of 21 voting members; of whom 21 voted affirmatively

**Report IV:** The Technical Committee proposes for adoption, a complete revision to NFPA 1994, **Standard on Protective Ensembles for Chemical/Biological Terrorism Incidents**, 2001 edition. NFPA 1994-2001 is published in Volume 12 of the 2004/2005 National Fire Codes and in separate pamphlet form.

NFPA 1994 has been submitted to letter ballot of the **Technical Committee on Hazardous Materials Protective Clothing and Equipment**, which consists of 22 voting members; of whom 22 voted affirmatively.

Mr. Stull voted affirmatively with this comment:

1. The committee is reminded that the both the challenge and end points (for establishing performance criteria) on barrier testing bear further investigation and harmonization with levels established for respiratory protection (at least for challenge concentrations). A similar analysis is needed for establishing the integrity levels for all Classes.
2. The Man-In-Simulant-Test requires further standardization and preparation as a stand-alone method to replace military procedures for greater accessibility for the PPE industry.
3. The proposed particulate resistance test is an ISO Final Draft International Standard that is set for approval and publication in late 2004. A review of this method is needed to succinctly determine appropriate pass/fail levels for Class 4 ensembles.
4. The committee should consider the use of surrogate chemical agents for testing at least for the follow-on testing requirements.
5. Greater design flexibility is needed in the standards to permit manufacturers to provide innovative products that can provide the protection at each class. For example, current footwear requirements appear to be design-restrictive.

NFPA 1994 has also been submitted to letter ballot of the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment**, which consists of 21 voting members; of whom 21 voted affirmatively

Mr. Curtis voted affirmatively with this comment:

The ROP clearly and appropriately discriminates between Class 2 and Class 3 through the Class 2 requirement to withstand the "SF6" challenge. The TCC's note to "investigate" the MIST method should not be taken as a way to reduce the challenges for Class 2. The MIST does not discriminate against inorganics and is far less challenging.

Mr. Stull voted affirmatively with this comment:

1. The committee is reminded that the both the challenge and end points (for establishing performance criteria) on barrier testing bear further investigation and harmonization with levels established for respiratory protection (at least for challenge concentrations). A similar analysis is needed for establishing the integrity levels for all Classes.
2. The Man-In-Simulant-Test requires further standardization and preparation as a stand-alone method to replace military procedures for greater accessibility for the PPE industry.
3. The proposed particulate resistance test is an ISO Final Draft International Standard that is set for approval and publication in late 2004. A review of this method is needed to succinctly determine appropriate pass/fail levels for Class 4 ensembles.
4. The committee should consider the use of surrogate chemical agents for testing at least for the follow-on testing requirements.
5. Greater design flexibility is needed in the standards to permit manufacturers to provide innovative products that can provide the protection at each class. For example, current footwear requirements appear to be design-restrictive.

**Note:** To assist in review and comment, a draft of NFPA 1983 is available and downloadable from the NFPA website at [www.nfpa.org](http://www.nfpa.org). It is also in CD ROM and print versions available from NFPA upon request by calling Customer Service at 1-800-344-3555.

1983-1 Log #CP2 FAE-SCE **Final Action: Accept**  
(Entire Document (MOS))

**Submitter:** Technical Committee on Special Operations Protective Clothing and Equipment

**Recommendation:** Completely revise entire document to comply with the NFPA Manual of Style as follows:

1. Revise Chapter 1 to contain administrative text only as follows:  
(show revised text here or indicate where revised text can be found)
2. Revise Chapter 2 to contain only referenced publications cited in the mandatory portions of the document.
3. Revise Chapter 3 to contain only definitions.
4. Revise so that all units of measure in document are converted to SI units with inch/pound units in parentheses.
5. Appendices are to be restructured and renamed as “Annexes.”
6. All mandatory sections of the document must be evaluated for usability, adoptability, and enforceability language. Generate necessary committee proposals as shown (or indicate where shown).
7. Reword exceptions as requirements.
8. Single sentences per requirement as shown (or indicate where shown).

**Substantiation:** Editorial restructuring, to conform with the 2000 edition of the NFPA Manual of Style.

**Committee Meeting Action:** Accept

1983-2 Log #CP3 FAE-SCE **Final Action: Accept**  
(Entire Document)

**Submitter:** Technical Committee on Special Operations Protective Clothing and Equipment

**Recommendation:** The Technical Committee on Special Operations proposes a complete revision to NFPA 1983, Standard on Fire Service Life Safety Rope and System Components, as shown at the end of this report. This document will be retitled, Standard on Fire Service Life Safety Rope and Equipment.

**Substantiation:** The standard was revised to comply to the NFPA Manual of Style. Additionally, proposals with affirmative actions were incorporated into this complete revision of the document.

**Committee Meeting Action:** Accept

1983-3 Log #CP1 FAE-SCE **Final Action: Accept in Principle**  
(1.3 Definitions (GOT))

**Submitter:** Technical Committee on Special Operations Protective Clothing and Equipment

**Recommendation:** Adopt the preferred definitions from the NFPA Glossary of Terms for the following terms:

**Belt.** (Preferred) NFPA 1006, 2003 ed.

A system component; material configured as a device that fastens around the waist only and designated as a ladder belt, an escape belt, or a ladder/escape belt.

**Belt.** (Secondary) NFPA 1983, 2001 ed.

A system component; material configured as a device that fastens around the waist only and designated as a ladder belt or an escape belt.

**Hardware.** (Preferred) NFPA 1670, 2004 ed.

Rigid mechanical auxiliary equipment that can include, but is not limited to, anchor plates, carabiners, and mechanical ascent and descent control devices.

**Hardware.** (Secondary) NFPA 1983, 2001 ed.

A type of auxiliary equipment that includes but is not limited to ascent devices, carabiners, descent control devices, pulleys, rings, and snap-links.

**Manufacturer.** (Preferred) NFPA 1901, 2003 ed

The person or persons, company, firm, corporation, partnership, or other organization responsible for turning raw materials or components into a finished product.

**Manufacturer.** (Secondary) NFPA 1983, 2001 ed.

The entity that assumes the liability and provides the warranty for the compliant product.

**Product Label.** (Preferred) BOILER: NFPA 1971, 2000ed.

A label or marking affixed to a product by the manufacturer that provides general information, warnings, instructions for care and maintenance, and other information.

**Product Label.** (Secondary) NFPA 1983, 2001 ed.

A label affixed to the product by the manufacturer containing general information, care, maintenance, or similar data.

**Sample.** (Preferred) NFPA 270, 2002 ed.

An amount of the material, product, or assembly to be tested that is representative of the item as a whole.

**Sample.** (Secondary) NFPA 1983, 2001 ed.

A specified number of life safety ropes or a specified number of system

components taken from a manufacturer's current production lot.

**Webbing.** (Preferred) NFPA 1670, 2004 ed.

Woven material of flat or tubular weave in the form of a long strip.

**Webbing.** (Secondary) NFPA 1983, 2001 ed.

Woven material in the form of a long strip; can be of flat or tubular weave.

**Substantiation:** Adoption of preferred definitions will assist the user by providing consistent meaning of defined terms throughout the National Fire Codes.

The following procedure must be followed when acting on defined terms (extract from the Glossary of Terms Definitions Procedure):

**2.1 Revising Definitions.**

**2.1.1** Prior to revising Preferred definitions, the Glossary of Terms should be consulted to avoid the creation of additional Secondary definitions.

**2.1.2** All Secondary definitions should be reviewed and eliminated where possible by the following method (in order of preference):

- a) adopt the preferred definition if suitable.
- b) modify the secondary term and/or definition to limit its use to a specific application within the scope of the document.
- c) request that the Standards Council determine responsibility for the term.
- d) request that the Standards Council authorize a secondary definition.

(extract from the NFPA Manual of Style):

**2.3.2.6** Existing general definitions contained in the NFPA Glossary of Terms shall be used where technically accurate and correct.

**Committee Meeting Action:** Accept in Principle

**Committee Statement:** The Committee has revised the definitions to reflect the latest edition of the Project Glossary on Definitions.

1983-4 Log #2 FAE-SCE **Final Action: Accept**  
(7.1.2.2)

**Submitter:** Robert J. Eugene, Underwriters Laboratories Inc.

**Recommendation:** Revise text as follows:

7.1.2.2 ANSI UL Publication. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062. American National Standards Institute, 11 West 42nd Street, 13th floor, New York, NY 10036.

ANSI/UL 913, Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations, 1988 2002 with revisions through December 2003.

**Substantiation:** Update to the most recent publication of the referenced standard. Reformat publisher to more clearly reflect the source of the publication. This is an ANSI approved publication under continuous maintenance whereby each revision is ANSI approved upon publication.

**Committee Meeting Action:** Accept